



Determining the Value of an Early Stage Enterprise

The present value of anything is determined by what is going to happen in the future.

A common form of this is the present value of the future free cash flow calculated by 'discounting' the cash flows in the future to a present value. This assigns more value to close in cash flow than cash flow that is further out in time.

In most situation, this is insufficient because future cash flows are not known with adequate reliability. There is a risk that must be factored in and the present value discounted to reflect this uncertainty.

In an early stage enterprise the need for cash for investment has several phases, and the arrangement of financing should be phased to reflect these needs. A typical phasing might look like this:

1. Funding to plan the enterprise and carry out initial research and feasibility studies.
2. Funding to the building and operation of a first full scale operation for a period long enough to establish reliable performance parameters.
3. Funding for initial scaling of the enterprise maybe in years 3 to 5.
4. Funding for further scaling of the enterprise maybe in years 6 to 10

For phase 1, funding comes from individual savings and from family and friends. There is 'sweat equity' as much as there is financial equity. Ownership is 100% and all the risk is born by this group.

Financial investment at this stage is expensive because the rish is high with the potential for success exceedingly uncertain.

The money value of the enterprise at this stage is low. No mater how high the potential of the idea, the present value of the idea taking the risk into consideration is near zero.

For phase 2, the building and operation of a full scale pilot project, the financing will be expensive and the smallest amount of financing should be mobilized consistent with the operating projections. What this means is that more than enough funding should be available for both the capital investment as well as stat up operating costs and a contingency for unforeseen problems that will almost certainly arise no matter how good the planning.

The value of the enterprise at this phase of financing is a function of several things:

First, the present value of the future cash flow arising from the enterprise taking into consideration

- (a) the pilot phase (2 above)
- (b) the first phase scale up (3 above)

- (c) the second phase scale up (4 above)

The cash flow will be determined both by the money profit and cash flow dynamics of the operations and the cost of financing to support the operations and the scale up.

The discount rate going into the future is a variable that depends on a lot of financial and economic considerations beyond the scope of this discussion. A rate of 6% may be used as an initial working assumption.

The computed present value needs to be further discounted based risk that depends on:

- the characteristics of the preliminary work ... technical, managerial, etc. and
- the characteristics of the external market ... market, etc.

The return expected from the financing of the pilot stage operation should be in excess of 100% per annum. For the calculation, speed is of the essence.

The discount rate going into the future is an important element. This is a complex subject discussed separately.

The risk factor is also important. While some elements of risk are outside the control of the enterprise, good planning and management can reduce the risk substantially.

In the enterprise performance project the 'value' of the enterprise increases over time.

In year 2, the financing for the pilot phase of \$5 million represents 30% of the present value after discounting for time and risk.

In year 4, the incremental financing for the 1st phase scale up of \$36 million represents 15% of the present value after discounting for the risk.

In both cases, the present value is based on the implementation of the scale up. Without scale up, the present value is much reduced. The pilot phases investors do not get an acceptable return unless there is scale up.

The concepts described above are presented in a spreadsheet format below. The first table is for a period of 8 years. A second table shows how the scale up might proceed over a period of 17 years.

In the first section there is a tabulation of the number of operations being put in operation in the year, and the cumulative number of operations.

The second section shows the amount of investment per year together with a provision for start up deficits. The section is totaled to show the annual investment and the cumulative investment.

The third section shows the free cash flow being generated by the investment. This is very simplified computation based on a free cash flow amounting to 20% of the amount invested. Note that this must be supported by detailed financial projections. The amount of 20% shown here is an ASSUMPTION for the purpose of demonstrating the valuation concepts.

Free cash flow may be used to finance further expansion or may be used to pay dividends to stockholders.

The next (fourth) section is the investment required at each stage to fund the capital and other expenditures required for the pilot phase and the scale up.

In the next section (fifth) there are calculations of net present value (NPV) based on future free cash flow for:

- the initial funding for the pilot project
- The next phase funding for the first scale up
- The second phase funding for the second scale up.

This section also discounts the NPV for risk at each stage.

The amount of equity of the project that equates to the amount of funding required is calculated.

In the final (fifth) section, the value of the equity for the initial innovators, the first phase angel investors, and then the next phase investors is calculated.

The initial innovators start off with 100% of the equity of a project that has no value.

By the time the project is ready for first stage pilot investment, the projections show that the project value based on NPV calculations and providing for risk is now significant. In order to raise the funds, an amount of equity must be relinquished. The value of the remainder of the equity is now substantial.

By the time the project is ready for second stage scale up and new financing is required, the value based on NPV calculations has increased. Furthermore the risk has reduced. The additional funding can be raised by relinquishing more equity at this higher valuation. The value of the initial innovators remaining stock is higher than before.

The same applies for the next third round of financing.

The first angel round investors start off with an investment that increases substantially by the time of the second round, and increases again when the third round financing takes place.

There is the opportunity at this stage for angel round investors to exit, by offering their stock to the new investors instead of diluting the initial innovators' equity.

The following tables show CONCEPTS only, and do NOT reflect the actual financial projections for the project.

The following tables are taken from a working spreadsheet where the various assumptions used for calculation can be changed.

BE CAREFUL ... FOR DISCUSSION ONLY

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TrueValueMetrics – Determining the Value of an Early Stage Enterprise

Table 1

YEAR		1	2	3	4	5	6	7	8
Pilot full scale operation		1							
Number of new operations – Scale up 1				2	3	4			
Number of new operations – Scale up 2							10	20	40
Ongoing scale up ...									
Number of total operations		1	1	3	6	10	20	40	80
COSTS									
Initial development costs	500								
First pilot costs	4000	0							
First pilot start up deficits	1000		0						
Capital costs – phase 1 expansion	4000			8000	12000	16000	0	0	0
Phase 1 start up deficits	1000				2000	3000	4000	0	0
Capital costs – phase 2 expansion	4000						40000	80000	160000
Phase 2 start up deficits	200							2000	4000
Ongoing capital costs per unit	4000								
Ongoing start up per unit	200								
Annual investment flow	500	0	0	8000	14000	19000	44000	82000	164000
Cumulative capital investment	500	500	500	8500	22500	41500	85500	167500	331500
Free cash flow (say % of invested capital)	20%								
Financed from operations free cash flow			100	100	1700	4500	8300	17100	33500
Cum financing from operations	0	0	100	200	1900	6400	14700	31800	65300
Financed in start-up team (family and friends)	500								
Financed by first round investors		5000							
Financed by second round investors				40000					
Financed by third round investors							500000		
Financing by period	500	5000	0	40000	0	0	500000	0	0
Cum total investment	500	5500	5500	45500	45500	45500	545500	545500	545500
Cum total funding	500	5500	5600	45700	47400	51900	560200	577300	610800
Cash – over (under)	0	5000	5100	37200	24900	10400	474700	409800	279300
Discount value of NPV calcs	6.0%								
NPV of operating free cash flow			389,139						
Risk adjustment Round 1	60%		233,483						
NPV at this stage			155,656						
Financing at this stage		5000							
Being this percentage of NPV and therefore this % of business equity		3.2%							
Discount value of NPV calcs	6.0%								
NPV of operating free cash flow				1,455,054					
Risk adjustment Round 2	40%			582,022					
NPV at this stage				873,032					
Financing at this stage				40000					
Being this percentage of NPV and therefore this % of business equity				4.6%					
Discount value of NPV calcs	6.0%								
NPV of operating free cash flow							2,679,431		
Risk adjustment Round 2	10%						267,943		
NPV at this stage							2,411,488		
Financing at this stage							500000		
Being this percentage of NPV and therefore this % of business equity							20.7%		
Innovator's equity	100%	96.79%	96.79%	92.21%	92.21%	92.21%	71.47%		
"Value" of innovator's equity		150,656		804,989			1,723,538		
First round investment		3.21%	3.21%	3.21%	3.21%	3.21%	3.21%		
"Value" of Angel Round investment		5,000		28,044			77,462		
First round investment				4.58%	4.58%	4.58%	4.58%		
"Value" of Next round investment				40,000			110,488		

TrueValueMetrics – Determining the Value of an Early Stage Enterprise

Table 2

YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Pilot full scale operation	1																
Number of new operations – Scale up 1			2	3	4												
Number of new operations – Scale up 2						10	20	40	60	80	0	0	0	0	0	0	0
Ongoing scale up ...											80	80	80	80	80	80	80
Number of total operations	1	1	3	6	10	20	40	80	140	220	300	380	460	540	620	700	780
COSTS																	
Initial development costs	500																
First pilot costs	4000	0															
First pilot start up deficits	1000		0														
Capital costs – phase 1 expansion	4000			8000	12000	16000	0	0	0	0	0	0	0	0	0	0	0
Phase 1 start up deficits	1000				2000	3000	4000	0	0	0	0	0	0	0	0	0	0
Capital costs – phase 2 expansion	4000						40000	80000	160000	240000	320000	0	0	0	0	0	0
Phase 2 start up deficits	200							2000	4000	8000	12000	16000	0	0	0	0	0
Ongoing capital costs per unit	4000											320000	320000	320000	320000	320000	320000
Ongoing start up per unit	200											0	16000	16000	16000	16000	16000
Annual investment flow	500	0	0	8000	14000	19000	44000	82000	164000	248000	332000	336000	336000	336000	336000	336000	336000
Cumulative capital investment	500	500	500	8500	22500	41500	85500	167500	331500	579500	911500	1247500	1583500	1919500	2255500	2591500	2927500
Free cash flow (say % of invested capital)	20%																
Financed from operations free cash flow			100	100	1700	4500	8300	17100	33500	66300	115900	182300	249500	316700	383900	451100	518300
Cum financing from operations	0	0	100	200	1900	6400	14700	31800	65300	131600	247500	429800	679300	996000	1379900	1831000	2349300
Financed in start-up team (family and friends)	500																
Financed by first round investors		5000															
Financed by second round investors				40000													
Financed by third round investors							500000										
Financing by period	500	5000	0	40000	0	0	500000	0	0	0	0	0	0	0	0	0	0
Cum total investment	500	5500	5500	45500	45500	45500	545500	545500	545500	545500	545500	545500	545500	545500	545500	545500	545500
Cum total funding	500	5500	5600	45700	47400	51900	560200	577300	610800	677100	793000	975300	1224800	1541500	1925400	2376500	2894800
Cash – over (under)	0	5000	5100	37200	24900	10400	474700	409800	279300	97600	-118500	-272200	-358700	-378000	-330100	-215000	-32700
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